New York Western Bean Cutworm Field Corn Monitoring Program
Progress Report (2010-2018)

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The Pest Problem

Western bean cutworm (*Striacosta albicosta* [Smith]) attacks corn (*Zea mays* L.; including field, sweet and popcorn) and dry beans (*Phaseolus vulgaris* L.), feeding on developing kernels or beans inside husks and pods, respectively. Western bean cutworm (WBC) infestations can cause significant yield losses and may facilitate subsequent colonization by pathogens, furthering damage and impacts. This pest has become an economic issue for many growers ranging from the Midwest through the Northeast US and Southern Ontario and Quebec. Loses from this insect can be as high as 8-10% in dry beans and 40% or more in field corn grain yields. WBC was first found in New York in 2009. This pest has expanded and has steadily increased across the state since first discovered. A trapping network was established in 2010 to monitor WBC populations as they invade NYS. In the last 3 years we have had economic damage in Northern and Western NY. This last year we also documented economic damage in the upper part of the Hudson Valley.

Monitoring Procedure:

WBC male moths are trapped using a green "universal" bucket trap hung on posts at the edge of corn or dry bean field sites. Traps contain the WBC pheromone lure that mimics a female scent to attract male moths. In addition, an insecticide strip is placed in the trap to kill the moths once inside. WBC trapping was initiated the second week of June and continued until early September. Traps were checked weekly, and the number of moths collected was recorded. Moth capture data was entered in PestWatch (www.pestwatch.psu.edu) and shared with the local and regional agricultural community through timely newsletters.

2010-2018 Results

Since the discovery of western bean cutworm in New York in 2009, we have monitored its progression across the state. In 2010, we established a WBC pheromone trap monitoring network. This network of Cornell Cooperative Extension Educators, crop consultants and agricultural professionals placed bucket pheromone traps to capture moths each year, targeting June through August. Each week the number of moths are counted and reported by the location of the trap. These traps are deployed to monitor moth presence and determine the peak flight. Traps help us identify fields at risk and when scouting should take place, but we cannot use trap counts to determine when a field should be sprayed with an insecticide.

Since 2010, the population of the WBC in New York has increased exponentially. We started with 19 volunteers and 44 traps in 29 counties, and in 2018, we had 50 volunteers and 118 traps in 45 counties. The expansion of the voluntary trapping network exemplifies the continued strong interest in monitoring this pest statewide.

Table 1. New York Western Bean Cutworm 2010 – 2018 Collection Data Summary*
(Includes traps in field corn, sweet corn and dry beans).

	2010	2011	2012	2013	2014	2015	2016	2017	2018
No. Counties	29	37	44	39	41	39	40	40	45
No. Traps	54	67	88	89	96	91	101	101	118
Avg. No. WBC / Trap	13	23	42	66	117	266	193	361	333
Range in Totals	0 - 99	0 - 165	0 - 344	0 – 853	0 – 1019	0 – 1688	0 – 1662	0-2464	0-2964
Peak Flight	2-Aug	2-Aug	25-Jul	21-28-Jul	3-Aug	2-Aug	31-Jul	8-Aug	1-Aug

The total number of WBC moths captured per trap in New York by year are depicted in Table 1. In 2010 there were less than 15 moths caught per trap with a high of 99. In 2018, we had 118 traps that caught 39,290 moths with an average of 333 moths per trap. Some traps in northern NY caught from 1000 to almost 3000 moths in a single trap. Northern NY is the hot spot for WBC, and the number of moths caught in this region of the state far exceeds the rest.

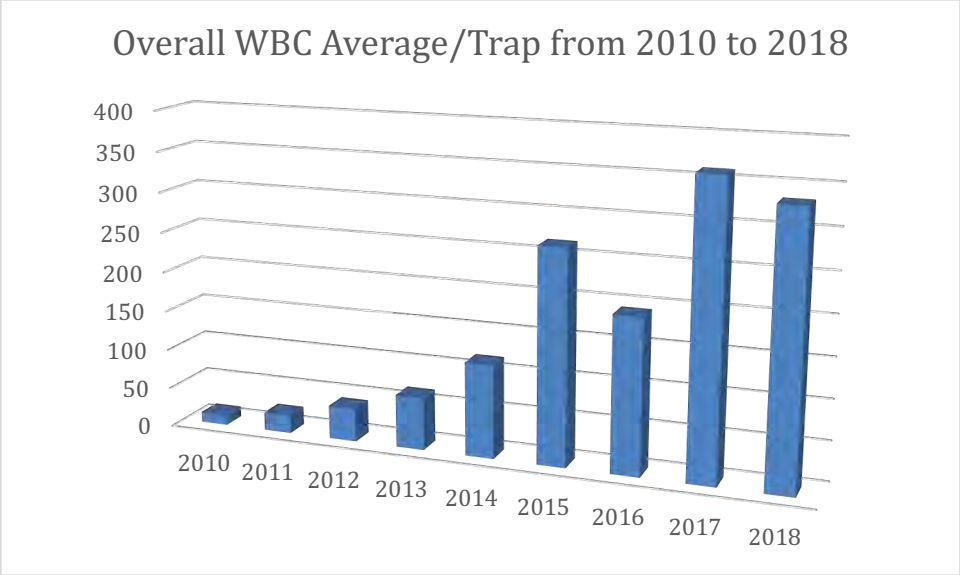

Figure 1: Overall average of WBC moth/trap captures statewide from 2010 to 2018 (Includes traps in field corn, sweet corn and dry beans).

When looking at the average number of moths caught per trap in 2018, 67% of the traps caught more than 100 moths and only 15% caught less than 20 moths. Jefferson County had a single seasonal trap accumulation of 2964 moths. The range of trap counts were 0 to 2964. While the average came down just a bit from 361/trap in 2017 to 333 /trap in 2018, we had many more traps in areas of the state that do not have the same pest population densities of Northern NY. This brought the average number of moths/trap down for the first time since 2016. In 2016, we had drought conditions that might have caused a reduction in population of WBC.

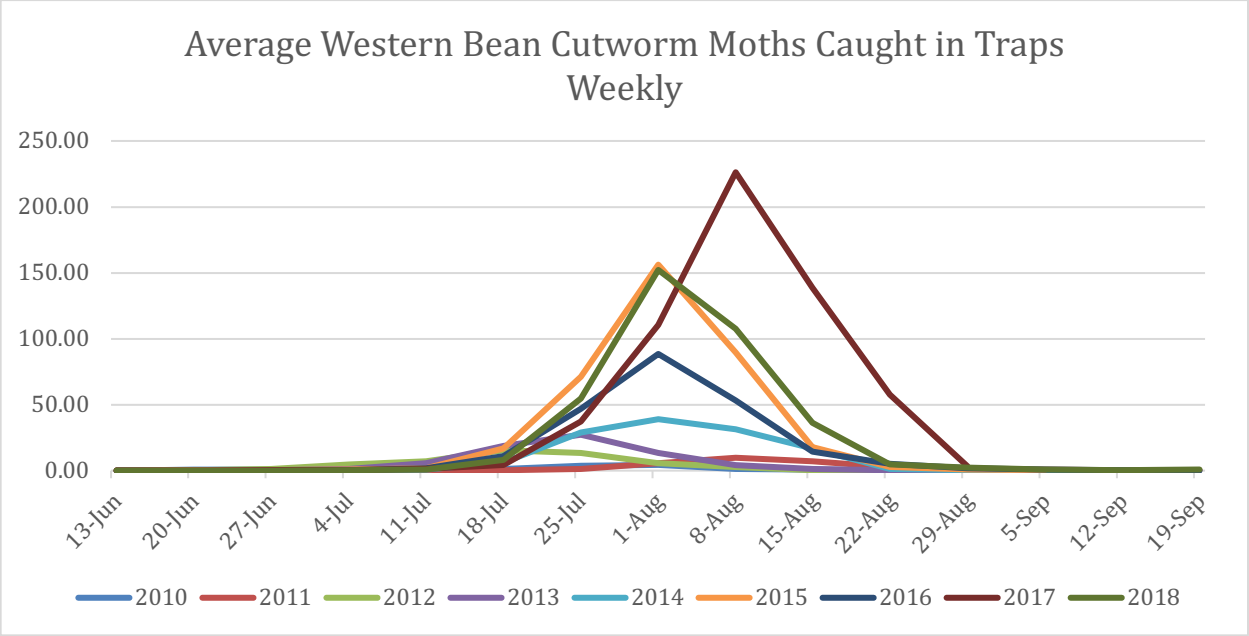

Figure 2: Average Western Bean Cutworm Moths Caught in Traps Weekly (Includes traps in field corn, sweet corn and dry beans).

A very important aspect of managing WBC is knowing when peak flight occurs. The annual peak flights are outlined in Figure 2. From 2010 to present, the peak flight has ranged from the last week in July to the first week in August. By knowing the peak flight, you know when most of the moths will be laying eggs in pre-tassel corn, because the female moths prefer to lay eggs on this stage of corn growth. And this peak flight time is when we should be vigilant about scouting for WBC egg masses and small larva.

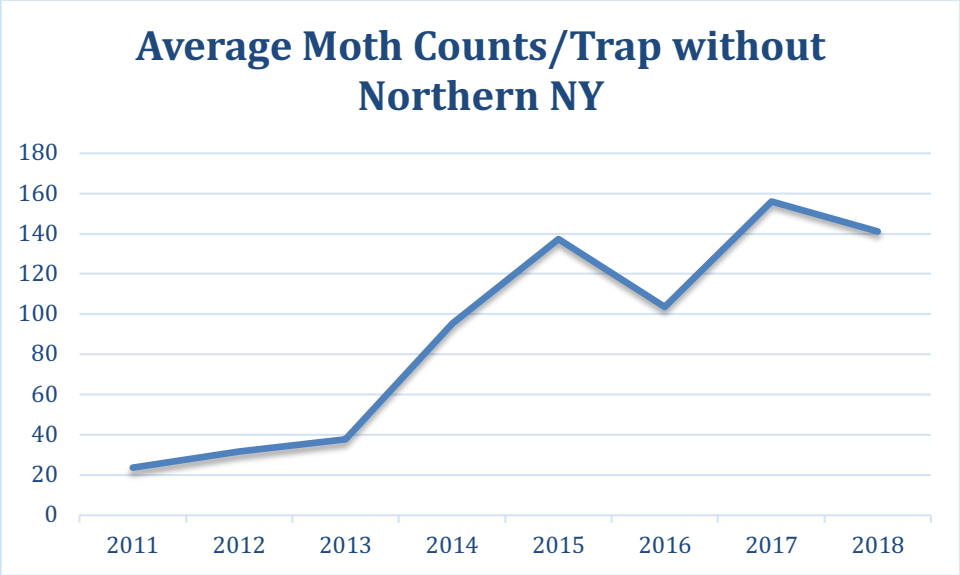

Figure 3: Average Moth Counts/Trap without Northern NY (Includes traps in field corn, sweet corn and dry beans).

The data are starting to show that the population is beginning to build up in areas of the state that have previously had lower populations of WBC. The data in Figure 3 indicates that the average number of moths caught per trap is increasing across the state outside of northern NY. In time, WBC populations will likely rise across the state to the point that management will be needed for this insect pest. Widespread, high WBC populations in many areas of Northern NY have resulted in some corn fields being treated with insecticides to manage this pest.

While WBC damage to corn ears can be significant and may have detrimental effects on corn grain yield and quality, the economic impact on corn silage is less understood. For corn silage growers, determining whether or not this pest significantly impacts the yield or quality of the forage is critical to their decision making for managing this pest.

Scouting corn at the pre-tassel stage of growth is an important aspect of managing this pest. The economic threshold is 5% of the plants having egg masses and small larvae. The 5% is an accumulated threshold, meaning that if week one you get 3% of the plants having egg masses and the next week you get 2% more, this adds up to a cumulative 5%.

Current strategies available for control of WBC in corn would be the use of foliar insecticides or selecting transgenic corn hybrids with the Vip3A trait. Foliar insecticide treatments are effective but can be difficult to time applications correctly and require specific application equipment. If a field is found to be over threshold for WBC, an insecticide should be applied only if fresh silks are present. If no tassel is present there is no reason to spray an insecticide because it would be too early and the larva will not survive, and once the larva make their way into the ear tip it is too late to spray as the insecticide will not come into contact with the larva. Currently, only corn hybrids with the Vip3A trait will provide control of the WBC. There have been reports from Michigan, Indiana, Ohio and Ontario, Canada suggesting varying levels of control of WBC with the Bt corn trait containing the Cry1F protein. Based on 2016 to 2018 on-farm research trials in Northern and Western NY, it was determined that NY populations of WBC are resistant to the Cry1F trait.

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